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The TOMATO FRUITWORM
How to control it

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The tomato fruitworm eats deep holes in tomato fruits. It occurs all over the United States, and does more damage to tomatoes than any other insect. An individual fruitworm commonly devours or ruins four or five fruits.

Tomato growers in the southern part of the country lose about $15 million each year because of tomato fruitworm damage. In seasons favorable to the insect's development—about every third year—losses are equally heavy in northern areas. By applying insecticides and using other control measures, growers can cut these losses 90 percent or more.

The scientific name of the tomato fruitworm is *Heliothis zea*. When this insect occurs on corn it is called the corn earworm; and on cotton, the bollworm.

DEVELOPMENT

The adult of the tomato fruitworm is a moth. The other life stages are egg, larva, and pupa.

The female moths lay their eggs singly on the tomato plants—usually on the leaves. In 4 to 6 days the eggs hatch into larvae (fruitworms), which immediately begin to feed on the foliage. In a day or two the fruitworms begin to move down the stems and eat into the fruits.

The fruitworms become full grown in about 20 days. Each drops or crawls to the ground, burrows 1 to 3 inches, and transforms to a pupa, which develops into a moth. The pupal stage lasts at least 2 weeks. Some individuals may remain in this stage until spring.

The moths emerge from the ground and start a new life cycle: They mate, and the females lay eggs.

There are more generations of fruitworms, and more severe infestations, in southern than in northern areas. Four or five generations are produced each year in southern areas.

CONTROL

The insecticides DDT, Sevin, TDE, toxaphene, and cryolite are effective against the tomato fruitworm on tomatoes. DDT, Sevin, TDE, or toxaphene is applied as a dust or as a spray. Cryolite is used in bait.

After deciding what insecticide to use, make three applications at 2-week intervals. Timing of the first

[1] Retired.

application is important. It should be made when the first fruits of the main crop are setting. At this time the fruits are 1/2 inch or less in diameter, and there are about five on each plant. Check on the fruit set, not the size of the plants, which may vary from 1 to 4 feet in diameter when the fruits are setting.

DUSTS AND SPRAYS

Apply the dust or the spray when there is little or no wind. Get it all over the foliage. The fruitworms must be killed while on the foliage—before they get to the fruit.

Dusts.—In each of the three applications, apply a dust containing 5 percent of Sevin at 40 pounds per acre, 10 percent of DDT or TDE at the rate of 30 pounds per acre, or 20 percent of toxaphene at 25 pounds per acre. With power dusters use two nozzles per row. With hand equipment dust one side of the row, then the other.

Sprays.—A spray is prepared by mixing DDT, TDE, or toxaphene wettable powder or emulsifiable concentrate or Sevin wettable powder or flowable concentrate with water.

The concentration of insecticide in the wettable powders, emulsifiable concentrates, and flowable concentrates vary with the insecticide and with the brands. Wettable powders are usually applied in high-pressure ground sprayers at 50 to 150 gallons per acre. Emulsifiable or flowable concentrates are usually applied in low-pressure sprayers at 5 to 20 gallons per acre. The sprays are prepared so that the following pounds of actual insecticide are used per acre, Sevin 2 pounds, DDT and TDE each 3 pounds, and toxaphene 5 pounds.

BAIT

An effective bait may be prepared by mixing cryolite (90-percent sodium fluoaluminate) with cornmeal. The proportions are 1 pound of cryolite to 10 pounds of cornmeal. Mix thoroughly. Scatter the bait evenly over the foliage by hand at the rate of about 60 pounds per acre (2 ounces per 100 square feet).

CULTURAL METHODS

Applying insecticides is the chief means of controlling the tomato fruitworm, but there are other things you can do: Disking or plowing of tomato fields and corn fields immediately after harvest kills many of the pupae in the soil. . . . Kill each fruitworm that you find while picking tomatoes.

If Other Pests Occur With the Tomato Fruitworm . . .

Tomato fruitworm infestations are sometimes accompanied by infestations of other pests.

Ordinary infestations of hornworms, the Colorado potato beetle, and cutworms can be controlled by using dusts or sprays recommended for the tomato fruitworm. To control severe infestations of hornworms, use TDE.

A severe infestation of leaf miners [1] may require the application of diazinon or parathion. You can buy a dust mixture containing the right percentage of insecticide for fruitworm control plus 1½ percent of parathion or diazinon. Do not mix your own parathion dust (see precautions). If you plan to spray the tomatoes, add 1½ pounds of 25-percent parathion or diazinon wettable powder or 1½ pints of 25-percent parathion or diazinon emulsifiable concentrate to the quantity of spray to be applied to 1 acre.

[1] *Liriomyza sp.*

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Make first application of insecticide when fruits have appearance shown here.

PRECAUTIONS

Insecticides are poisonous. Handle them with care. Follow all directions and heed all precautions on the labels.

Parathion is extremely poisonous and may cause death if swallowed, inhaled, or absorbed through the skin. It should be applied only by a person thoroughly familiar with its hazards, who will assume full responsibility for safe use and comply with all precautions on the labels. Do not apply parathion within 10 days before a harvest.

Diazinon and toxaphene can be absorbed through the skin in harmful quantities. Avoid spilling them on the skin. Keep them out of the eyes, nose, and mouth. If you spill any on your skin or clothing, bathe and change clothing immediately. If it gets in your eyes, rinse with plenty of water for 15 minutes and get medical attention. Do not apply diazinon or toxaphene to tomatoes within 3 days before a harvest.

Do not apply DDT within 5 days or Sevin or TDE within 1 day before a harvest.

To protect sources of water supply, fish, and wildlife, be careful not to contaminate streams, lakes, or ponds with insecticides. Do not clean spraying equipment or dump excess spray material near such water. Avoid contaminating nearby crops by drift of sprays or dusts. Avoid drift of insecticide into bee yards.

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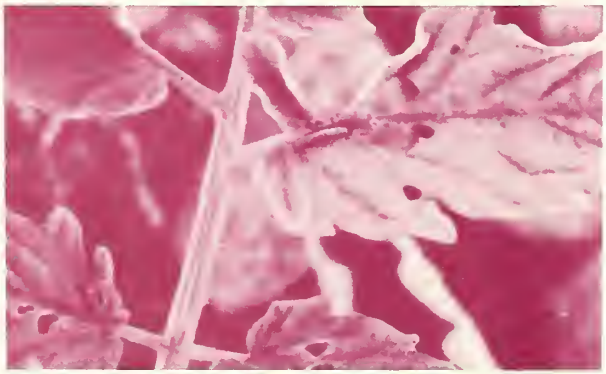
The adult of the tomato fruitworm is a buff-colored moth about 1 inch long (above). Females lay white, spherical eggs smaller than a pinhead. The young larvae feed on tomato leaves until they are about ½ inch long (below). Newly hatched larvae are whitish and less than ⅛ inch long. They soon become brown.



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When they become about ½ inch long, the larvae begin feeding on the fruit. Full-grown larvae are about 1¼ inches long. They may be green, brown, or pink. The heads are orange.

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The pupae, to which the larvae transform after burrowing into the soil, look like brown capsules. They are about ¾ inch long. Below: Pupa in its cell at the bottom of a burrow.

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